Name: _____

Date: _____

Box and Whisker Plots with Outliers of Money Earned

How to Get a Random Sample from CensusAtSchool

Go to the CensusAtSchool Random Sampler to download a sample.X
Reference year: *(select year)*
Sample size: *At least 60 students so that you have two categories with at least twenty students*
Select questions: *Money received*
Location: *Select location* **Year level:** *(select a range of year levels)*

To protect privacy there is a rule built into the sampler that the requested sample size cannot exceed 10% entered.

Outliers

All outliers need to be investigated to see whether they are the result of an error or are true outliers. If there are errors we remove them. We can often identify possible outliers by eye as they are different to the rest of the data set. However, it can useful to have an agreed method to identify outliers.

1. Why might it be useful to have one agreed method to identify outliers rather than just using your eye to identify them?

Using the IQR to Identify Outliers

2. In the CensusAtSchool random sample find the data on the ways students earned or received money in the last week. Select two ways money was earned or received. If there are not at least twenty students in each group, choose another sample.

3. For each group calculate and clearly record the 5 figure summary (min, Q_1, med, Q_3, max) as well as the IQR (inter quartile range).

In a box and whisker plot. a value is said to be an outlier if it occurs more than 1.5 ¿ the IQR beyond the box.

4. Calculate 1.5 ¿ IQR for both of your data sets. Add this number to Q_3. This number is called the upper fence. Subtract the same number from Q_1. This number becomes the lower fence. Clearly record the IQR and upper and lower fence for both sets of data.

Upper fence

Lower fence

5. Give your work to a classmate to check and sign that you have calculated the fences correctly and that your box and whisker plots show any outliers that you found.

Upper fence correct ☐ Lower fence correct ☐

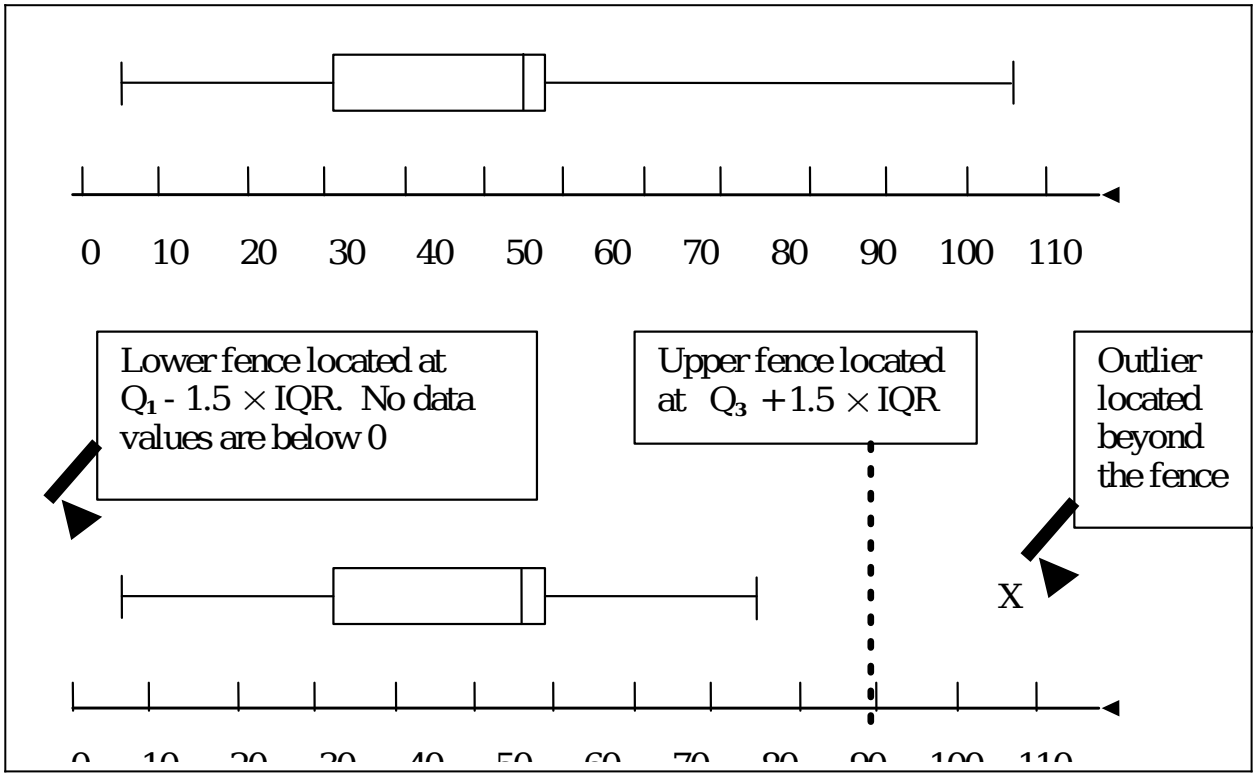

Figure 1.Example of fence shown on box and whisker plot

6. Decide on a scale appropriate for your data and then using the same scale, draw a box and whisker plot for both sets of data. Show the fences with a dotted vertical line. Any values beyond the fences are not joined to the whisker. Instead they are shown with a cross. Each whisker will end at the most extreme values within the fences.